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Precipitation and Generation of Dislocations in an Al–Mg Alloy*

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Abstract

Some features of precipitation in an Al–8.5 wt.% Mg alloy were investigated by means of transmission electron microscopy. Needle-like (or rod-like) precipitates of various orientations and plate-like precipitates on both {100} and some planes deviated from {100} towards {130} were present in the specimens aged at 150°C and 200°C.

At an early stage of ageing, dislocation loops were observed around some small precipitates, which were formed by the annihilation of the excess quenched-in vacancies. During the growth of precipitates, a large number of dislocations were generated around the precipitates.

Some possible mechanisms of the dislocation generation in the last case were discussed, considering the nature of stress-field around the precipitates.

Also, some movements of dislocations during growth of precipitates were observed by heating the thin foils in the electron microscope. The distribution of dislocations observed in the aged bulk specimens can be explained from such movements of dislocations during ageing.

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